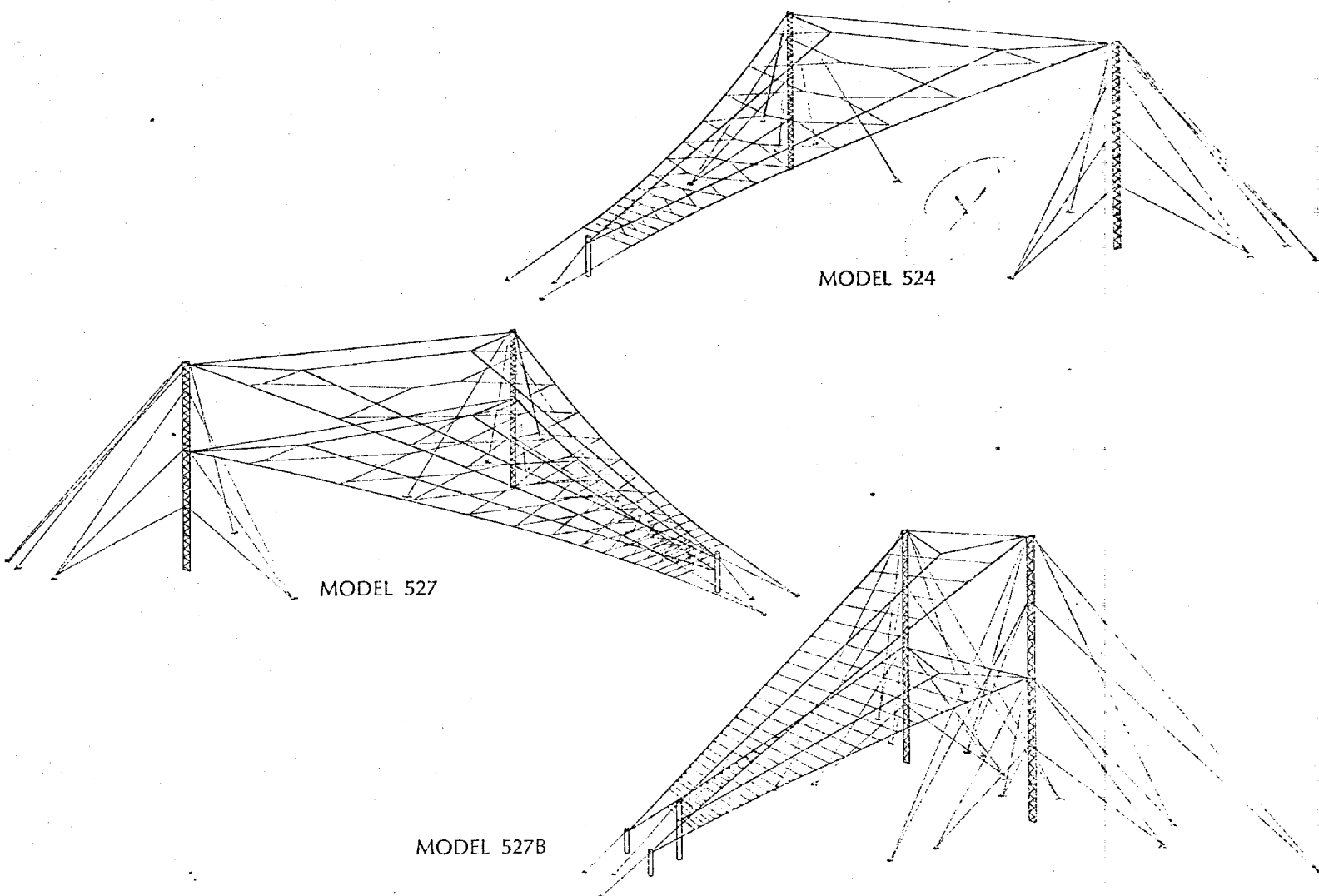


## Super High Gain Log-Periodic Antennas



Highly reliable communications on long-range circuits require antennas with high power gain at low take-off angles. In addition, ionospheric variations resulting in frequent changes in frequency make it desirable for the antenna to have a wide frequency bandwidth. The conventional approach to achieve wide band, highly directive antennas has been to use multiple rhombic antennas which rely heavily on end-fire gain to achieve their directivity and hence are quite large. Typical installations exceed 1,000 feet in length and require large investments in land.

Log-periodic antennas have long been desired for their wide band characteristics, efficient land use, and modest price. Heretofore, increasing the gain of a log-periodic has been attempted through

end-fire techniques. This approach results in very large structures which are difficult to support and install.

Small structures with very high gain are now possible with techniques developed at TCI which employ broadside gain. Use of the clamped mode technique\* physically increases the width of the radiating aperture resulting in larger broadside gain. The width of the active region of the 524 and 527 is one and one half wavelengths.

Individual radiators resemble a saw-tooth and are the electrical equivalent of "fattened" radiators with low Q. The reduction in Q increases the power handling capability and lengthens the effective active region resulting in greater radiation efficiency.

- **Reliable Communications on Long Range Circuits**
- **High Power Gain — Over 18 dBi**
- **Wide Frequency Bandwidth — 4 to 30 MHz**
- **Small Land Area — Replaces Rhombic Twice the Size**
- **Low Take-Off Angle**

It is well known that antennas experience undesirable ground losses without the use of sizable ground screens. Because the TCI super high gain antennas are horizontally polarized, ground losses are negligible and the maximum possible antenna gain is actually achieved without ground screens.

All TCI antennas share the same high quality, exhaustively tested components and materials. All radiators, feedlines, and catenaries are of Alumoweld, a wire composed of a high strength steel core and a highly conductive corrosion resistant

an radiator tip insulators are made of high strength glazed alumina, a material with an extremely low loss tangent (.001) and virtually impervious to the effects of ultraviolet radiation, dirt, and salt spray.

Fixed station log-periodic antennas traditionally have used fiberglass catenary and drop rod assemblies on the basis of excellent dielectric and tensile strength properties. However, field experience has shown that minute, difficult-to-detect flaws in the material, R F burning, small nicks incurred during installation handling

failures, and deterioration when stored for long periods of time at high temperature and humidity, all contribute toward a definite need for improvement. The TCI antennas use Alumoweld catenaries, broken up by fail-safe insulators.

The TCI towers are furnished with either 6061-T6 aluminum or galvanized steel. All bolts and nuts are of the same material as the tower thereby eliminating all dissimilar metal contacts.

## SPECIFICATIONS

### MODEL 524 ANTENNA

The Model 524 is a single curtain antenna utilizing the clamped mode fattened radiator design. The antenna is three half wavelengths wide resulting in a dramatic increase in the broadside radiating aperture. The antenna gain is 15.5 dBi minimum, 16 dBi nominal and the azimuthal beamwidth is 38°. On a long point-to-point circuit where wide azimuth coverage is not required this antenna provides reliable communications with a single antenna curtain.

Polarization	Horizontal
VSWR	2.0:1 maximum
Azimuth Beamwidth	38° nominal
Front-to-Back Ratio & Side Lobe Level	13 dB nominal
Environment	140 MPH wind, no ice 90 MPH wind with 1/2" radial ice Optional: 100 MPH, no ice

### Size

Model	Frequency	Height (Ft.) (Mtr.)	Length (Ft.) (Mtr.)	Width (Ft.) (Mtr.)
524-3-N	4-30 MHz	141 42.9	406 123.8	597 182.5
524-6-N	5-30 MHz	121 36.8	358 109	514 157
524-4-N	6.2-30 MHz	101 30.8	285 86.87	395 120.4

measured from extreme guy points

### Gain and Pattern Data

Freq.	Gain	LHPP	TOA	UHPP
fo	15.5 dBi	15°	27°	42°
15 MHz	16.0 dBi	9°	19°	29°
21 MHz	16.5 dBi	9°	17°	27°
25 MHz	16.5 dBi	8°	15°	24°
30 MHz	16.5 dBi	8°	14°	23°

### Power and Impedance Data

Model Number	Input Impedance	Power	Connector
524-N-02	50 ohm	Receive	Type N
524-N-03	50 ohm	10/50 kw	1 5/8"
524-N-04	50 ohm	25/50 kw	1 5/8"
524-N-06	50 ohm	1/2 kw	Type N

### ELEVATION AND AZIMUTH PATTERNS (Azimuth pattern at elevation angle of beam maximum) gain in dBi

